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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/539,301	06/16/2005	Won-Hyun Jung	0630-2356PUS1	8508

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EXAMINER	
LEY, FRANCISCO M	

ART UNIT	PAPER NUMBER
3746	

NOTIFICATION DATE	DELIVERY MODE
10/05/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/539,301	JUNG ET AL.	
	Examiner	Art Unit	
	Francisco M. Ley	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 June 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :8/13/2007, 3/12/2007, 6/16/2005.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

Page 1, Line 14: "researches" should recite, "research". This error is also repeated on Page 1, Line 20.

Page 2, Line 6, "isobutene" should be changed to "isobutane". This error is also repeated on Page 2, Lines 18, 21; Page 9, Line 23; and Page 10, Line 1.

Appropriate correction is required.

Claim Objections

2. Claim 1 is objected to because of the following informalities:

Line 8 recites, "mover disposed spaced apart" which should probably be, "mover disposed apart" or "mover spaced apart".

Lines 10-11 recite, "having **an** combustibility" which should probably recite, "having combustibility".

A period should be placed at the end of the claim, on Line 18 after "lubricating operation".

Appropriate correction is required.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent

and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1-10 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 3-11 of copending Application No. 10/539,310. Although the conflicting claims are not identical, they are not patentably distinct from each other.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

The following table outlines the conflicting claims between the current application and copending application 10/539310:

Current Application (10/539301) – Reciprocating Compressor for Compressing Refrigerant	**Copending Application* (10539310)** – Refrigerating System Having Reciprocating Compressor *(Some claims are not repeated entirely. For these cases only the pertinent sections have been extracted and are shown in quotes)
Claim 1: A reciprocating compressor for compressing a refrigerant comprising: • a hermetic container to which a suction pipe and a discharge pipe; • a driving unit having a stator fixed inside the hermetic container and a mover disposed spaced apart from the stator and linearly and reciprocally moved according to an interaction with the stator; • an organic compound refrigerant sucked into the suction pipe, having an combustibility and explosiveness and consisting of only carbon and hydrogen • a compression unit for receiving a reciprocal motional force of the driving unit and making a compression operation on the organic compound refrigerant; and • a mineral-based lubricant filled at a lower portion of the hermetic container; and a lubrication unit for supplying the mineral-based lubricant to each motional portion of the driving unit and the compression unit and performing a lubricating operation	Claim 1: A reciprocating compressor comprising: • "a reciprocating compressor which includes a driving unit having a stator consisting of an outer stator fixed inside a hermetic container" • "a mover consisting of magnets disposed at regular intervals between the outer stator and the inner stator and linearly and reciprocally moved" • "an organic compound refrigerant sucked into the evaporator and comprising carbon and hydrogen, a sort of natural refrigerant and having combustibility and explosiveness" • "a compression unit for performing a compressing operation on a refrigerant upon receiving the linear reciprocal motional force of the driving unit, and a lubrication unit for supplying the lubricant, a sort of a mineral oil, to each motional portion of the driving unit and the compression unit and performing a lubrication operation" • "a mineral-based lubricant stored inside a hermetic container of the reciprocating compressor and performing a lubricating operation on each sliding part"
Claim 2: The reciprocating compressor of claim 1, wherein the stator comprises:	Claim 1: • "a driving unit having a stator

• an outer stator fixed at the hermetic container; • an inner stator disposed with a certain air gap with an inner circumferential surface of the outer stator; and • a winding coil would at one of the outer stator and the inner stator, to which power is applied from an external source, and • the mover comprises magnets disposed at regular intervals between the outer stator and the inner stator and being linearly and reciprocally moved when power is applied to the winding coil; and a magnet frame having the magnets mounted thereon and transmitting a linear and reciprocal motional force to the compression unit.	consisting of an outer stator fixed inside a hermetic container" • "an inner stator disposed with a certain air gap with an inner circumferential surface of the outer stator" • "a winding coil wound at one of the outer stator and the inner stator, to which power is applied from an external source" • "a mover consisting of magnets disposed at regular intervals between the outer stator and the inner stator and linearly and reciprocally moved when power is applied to the winding coil and a magnet frame, in which the magnets are mounted, for transmitting a linear reciprocal motional force to a compression unit"
Claim 3: The reciprocating compressor of claim 1, wherein the compression unit comprises: • a piston connected to the mover and linearly and reciprocally moved; • a cylinder, into which the piston is slidably inserted, for forming a certain compression chamber; • a suction valve mounted at a refrigerant passage formed at the piston and preventing a backflow of the refrigerant after being introduced into the compression chamber; and • a discharge valve mounted at the front side of the cylinder and performing an opening and closing operation on the compressed refrigerant.	Claim 4: The refrigerating system of claim 1, wherein the compression unit comprises: • a piston connected to the mover and linearly and reciprocally moved; • a cylinder into which the piston is slidably inserted to form a certain compression chamber; • a suction valve mounted at a refrigerant passage 56 formed at the piston and preventing a backflow of the refrigerant after being introduced into the compression chamber; and • a discharge valve mounted at the front side of the cylinder and performing an opening and closing operation on a compressed refrigerant.
Claim 4: The reciprocating compressor of claim 1, wherein the lubrication unit comprises: • a lubricant pumping unit for	Claim 5: The refrigerating system of claim 1, wherein the lubrication unit comprises: • a lubricant pumping unit for

pumping the lubricant filled as much as a certain amount at a lower portion of the hermetic container; and • a lubricant supply passage for supplying the lubricant pumped by the lubricant pumping unit to a frictional portion between the piston and the cylinder.	pumping a lubricant filled with a certain amount at a lower portion of the hermetic container; and • a lubricant supply passage for supplying the lubricant pumped by the lubricant pumping unit to a frictional portion between the piston and the cylinder.
Claim 5: • The reciprocating compressor of claim 1, wherein the refrigerant is isobutane (R600a) which is hydrocarbon-based and has a molecular formula of $CH(CH_3)_3$.	Claim 6: • The refrigerating system of claim 1, wherein isobutane (R600a) which is hydrocarbon-based and has a molecular formula of $CH(CH_3)_3$ is used as the refrigerant.
Claim 6: • The reciprocating compressor of claim 1, wherein the lubricant is a paraffin-based lubricant.	Claim 7: • The refrigerating system of claim 1, wherein, wherein the lubricant is a paraffin-based lubricant.
Claim 7: • The reciprocating compressor of claim 1, wherein the lubricant has a density of 0.866~0.880 g/cm^3 at a temperature of 15°C and a flash point of above 140° C.	Claim 8: • The refrigerating system of claim 1, wherein the lubricant has a density of 0.866~0.880 g/cm^3 at a temperature of 15°C and a flash point of above 140° C.
Claim 8: • The reciprocating compressor of claim 1, wherein the lubricant has a kinematic viscosity of 7.2~21.8 mm^2/s at a temperature of 40°C and a viscosity index of 73~99.	Claim 9: • The reciprocating compressor of claim 1, wherein the lubricant has a kinematic viscosity of 7.2~21.8 mm^2/s at a temperature of 40°C and a viscosity index of 73~99.
Claim 9: • The reciprocating compressor of claim 1, wherein the lubricant has a flow point of below -25°C and a total acid number of below 0.01 mg KOH/g.	Claim 10: • The reciprocating compressor of claim 1, wherein the lubricant has a flow point of below -25°C and a total acid number of below 0.01 mg KOH/g.
Claim 10: • The reciprocating compressor of claim 1, wherein the lubricant has a water content of below 20 ppm and a breakdown voltage of above 30 kV.	Claim 11: • The reciprocating compressor of claim 1, wherein the lubricant has a water content of below 20 ppm and a breakdown voltage of above 30 kV.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Song et al. (U.S. Patent 6,435,842; Hereinafter, Song) in view of Morita et al. (U.S. Patent 6,575,716; Hereinafter, Morita).

7. Regarding claims 1, 2, 3, 4, and 5, Song discloses a hermetic container V to which a suction pipe SP and a discharge pipe DP are connected. A driving unit has a stator 4B fixed inside the hermetic container and a mover 5 disposed apart from the stator and linearly and reciprocally moved according to an interaction with the stator (Column 1, Lines 32-35). Stator 4B is fixed at the hermetic container (Column 1, Line 29) and an inner stator 4A is disposed with a certain air gap (Column 1, Lines 30-31) with an inner circumferential surface of the outer stator. A winding coil to which power is applied from an external source is wound at the outer stator 4B and is shown by an "X" in Figure 1. The mover 5 comprises magnets disposed at regular intervals between the outer stator and the inner stator and being linearly and reciprocally moved when power is applied to the winding coil (Column 1, Lines 33-35). The mover 5 further serves as a magnet frame having magnets mounted on it and transmitting a linear and reciprocal motional force to the compression unit (Column 1, Lines 33-35).

The compression unit disclosed by Song includes a piston 6 connected to the mover 5 and linearly and reciprocally moved (Column 1, Lines 33-35), as well as a cylinder 3 into which the piston 6 is slidably inserted, for forming a compression chamber. Also included are a suction valve 8 (Column 1, Line 58) mounted at a refrigerant passage formed at the piston and preventing a backflow of the refrigerant after being introduced into the compression chamber as is well known in the art, as well as a discharge valve 9a (Column 1, Line 59) mounted at the front side of the cylinder and performing an opening and closing operation on the compressed refrigerant, as is also well known.

A lubrication unit O is shown in Figure 1 having a lubricant pumping unit for pumping oil at a lower portion of the hermetic container, and a lubricant supply passage for supplying the lubricant pumped by the lubricant pumping unit to a frictional portion between the piston and cylinder (Column 1, Lines 18-20).

Song does not disclose that the reciprocating compressor includes a mineral-based lubricant or an organic compound refrigerant. However, Morita discloses in Figure 6 a reciprocating compressor that may use mineral oil (Column 1, Lines 56-57) and a refrigerant such as isobutane (Column 2, Line 9) which is hydrocarbon based and has a molecular formula of C_2H_{10}.

It would have been obvious at the time the invention was made to include in Song the use of mineral oil and isobutane as disclosed by Morita, as Song simply does not specify the type of oil or refrigerant used, and Morita discloses that it is conventional

for linear compressors to use mineral oil (Column 1, Lines 56-57, 63-634) and isobutane (Column 2, Lines 7-9).

8. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 above, and further in view of Chevron 600R (http://web.archive.org/web/20010217041255/www.chevron.com/prodserv/BaseOils/neutral_prop.htm).

Song in view of Morita as applied to claim 1 above discloses all the limitations as claimed except that neither Song nor Morita specify that the oil used in the compressor is paraffin-based and has specific values regarding density and flash point. However, as disclosed on the webpage, Chevron 600R is 72% paraffinic with a flash point above 140°C (270°C specifically) and a density between 0.866~0.880 g/cm^3 (.8740 g/cm^3 specifically) which is calculated from the specific gravity (.8740) at 60°F, or 15°C. The specific gravity equals the ratio of the density of the oil to the density of water (1 g/cm^3), and therefore the density of the oil is .8740 * 1 g/cm^3 which equals .8740 g/cm^3.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an oil in Song or Morita such as Chevron 600R. As is disclosed in the description webpage (http://web.archive.org/web/20010217040328/www.chevron.com/prodserv/BaseOils/neutral.htm), Chevron 600R provides "superior cold-flow performance" which would make it desirable for compressors such as those disclosed by Song and Morita that are used in low temperature refrigeration applications.

9. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 above, and further in view of Chevron 100R (http://web.archive.org/web/20010217041255/www.chevron.com/prodserv/BaseOils/neutral_prop.htm).

Song in view of Morita as applied to claim 1 above discloses all the limitations as claimed except that neither Song nor Morita give specific viscosity values for the oil used in the compressor. However, as disclosed on the webpage, Chevron 100R has a kinematic viscosity at 40°C between 7.2~21.8 mm^2/s (19.7 cSt specifically; 1 cSt = 1 mm^2/s).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an oil in Song or Morita such as Chevron 100R for the same reasons regarding cold flow performance applied to Claims 6 and 7, which apply to Chevron 100R as well as Chevron 600R. Note: The URL of the web pages from the Internet Archive indicates that the websites date from February 17th, 2001, which is more than one year prior to the effective date of the present application.

10. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 above, and further in view of Sunaga et al. (U.S. Patent 6,454,960; Hereinafter, Sunaga).

Song in view of Morita as applied to claim 1 above discloses all the limitations as claimed except that neither Song nor Morita disclose specific values for the flow point or total acid number of the oil. However, Sunaga discloses a compressor using an oil

having a pour point of –40°C or less and a total acid number of 0.02 mgKOH/g or less (Column 5, Lines 3-5).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to include oil in Song and Morita with the properties disclosed by Sunaga. This would allow, as Sunaga discloses, "*a preferable refrigerator to be obtained since the total acid number of a polyvinyl ether oil is reduced to restrain the generation of a metal soap to prevent adverse effect on the refrigerating cycle*" (Column 9, Lines 8-11).

11. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 above, and further in view of Kondo et al. (U.S. Patent 5,342,533; Hereinafter, Kondo) and Kusayanagi et al. (U.S. Patent 4,770,763; Hereinafter, Kusayanagi).

Song in view of Morita as applied to claim 1 above discloses all the limitations as claimed except that Song and Morita do not disclose that the lubricant has specific properties for water content or breakdown voltage. However, Kondo discloses a refrigerator oil composition having a water content of not more than 20 ppm (Column 7, Lines 14-15). It would have been obvious to one of ordinary skill in the art at the time of the invention to include oil in Song and Morita having water content less than 20 ppm as disclosed by Kondo, who discusses that water has an unfavorable influence on the thermal stability of oil (Column 7, Lines 8-11).

Kusayanagi discloses in Table 5 an oil ('Sample A of the Invention A') having a breakdown voltage of 70.3 kV (Column 8, Line 57). It would be obvious to one of ordinary skill in the art to include an oil in Song and Morita having a high breakdown

voltage such as that disclosed by Kusayanagi. This would provide better insulating properties in an application where the oil should not conduct electricity between elements, such as in a reciprocating compressor.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Japanese Patent JP 08200224 discloses a compressor using isobutane and a mineral oil.

Japanese Patent Application JP 2003003958 discloses a hermetic electric compressor using R600A as a coolant.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Francisco M. Ley whose telephone number is (571) 270-1299. The examiner can normally be reached on Monday-Friday, 8:30am-6:00pm, Alt Fridays, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Stashick can be reached at (571) 272-4561. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at (866) 217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call (800) 786-9199 (IN USA OR CANADA) or (571) 272-1000.

/FML/
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